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## A VEGETATION MAP OF NORTH AMERICA

J. W. HARSHBERGER. **[Wall map of the] Vegetation of North America.** Scale, 1: 6,170,000. Rand, McNally & Co., Chicago and New York, 1920. $8.00 with wood rod at top and bottom.

The present wall map of the vegetation of North America, prepared by Dr. J. W. Harshberger of the University of Pennsylvania, is suitable for high school and college use and is of interest to all students of plant geography and ecology. The colors and conventions used for the various areas are distinctive, and the mechanical execution of the map is very satisfactory. The author has been successful, in most portions of the map, in mediating between the coarse outlines necessary in a wall map and the accuracy that is necessary in being faithful to the facts. The absence of all political boundaries makes it very difficult, however, to locate specific areas or the lines separating different vegetations.

Twenty-nine types of vegetation are delineated: 8 purely coniferous forest, 4 partially coniferous forest, 4 deciduous forest, 3 sub-tropical and transition types of forest, 2 grassland, 4 desert, and 4 swamp, marsh, and arctic treeless regions. The designations of the various areas are partly in purely botanical terms and partly in terms of the botanical characteristics in conjunction with the geographical location of the areas. In two cases—"Vegetation of San Joaquin and Sacramento Valleys" and "Vegetation and Forests of the Pacific Coast Ranges"—no hint is given as to the character of the vegetations involved. It is not clear what criteria have been used in distinguishing "Tundra and Barren Lands" from "Treeless Regions (above tree limit)." It is doubtful whether the distinguishing features of the "Coniferous Forests of the Northern Rocky Mountains" and the "Coniferous Forests and Vegetation of the Southern Rocky Mountains" are as great as those used in differentiating the other coniferous areas. The distinction involved here is largely a floristic rather than a vegetational one, as is also the case with respect to the characterization of the Edwards Plateau forest of Texas as a "meeting place for plants of Atlantic Coast, Rocky Mountains, and Mexico." The demarcation between the coniferous forests of the southern Rocky Mountains and the sub-temperate hardwood forests of the eastern and western Mexican Cordilleras has been made too far to the north, so far as purely vegetational characteristics are concerned. Much of the area designated as "Deciduous Swamp Forests of the Lower Mississippi Basin" is actually marsh land, occupying a territory of considerable size.

Certain areas of deciduous forests in the highlands of southern Mexico have unfortunately been combined with the very dissimilar vegetations of the eastern and western coasts of Mexico and with the so-called chaparral of southern Texas, and the whole is so designated in the legend as to give the impression that chaparral is synonymous with deciduous forest.

While it is always easy to criticize specific details of a map of this character, it is necessary to bear in mind the very great difficulties involved in its preparation, both with respect to sources of information and the interpretation of very complex plant communities. Viewed as a whole, and with due regard to the difficulties of the task, Professor Harshberger's map is a very creditable piece of work. He has escaped two of the leading pitfalls into which authors of vegetational maps are likely to fall: he has based his areas on purely botanical criteria, without regard to climate, soil, topography, or other causal conditions; and he has used vegetational characteristics in distinguishing his areas, with a minimum of reference to the unrelated floristic features.

FORREST SHREVE

## SOLAR RADIATION AND THE WEATHER

H. H. CLAYTON. **Variation in Solar Radiation and the Weather.** Introductory note by C. G. Abbot. vi and 53 pp.; maps, diagrs. *Smithsonian Misc. Colls.*, Vol. 71, No. 3. Washington, D. C., 1920.

In the effort to explain the puzzling complexity of changes of climate in the geologic past, variations in the intensity of solar radiation were long ago appealed to as a probable cause. Recently several writers have brought forward a similar explanation in connection with short-period oscillations or fluctuations in various meteorological conditions of the present time. It has, however, remained for Mr. H. H. Clayton, chief of the forecast division of the Argentine Weather Service, to make an intensive study of the relations between solar radiation values and succeeding weather conditions with a view to the improvement and extension of the daily weather forecasts. Mr. Clayton's investigation is therefore distinctly pioneer work, of the greatest practical scientific interest and value. As Dr. C. G. Abbot says in the introduction to the present monograph, the conclusion reached "is of a very revolutionary character and deserves the most careful attention of meteorologists and students of solar physics"